

What is claimed is:

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1           1. A method for printing with a bidirectional inkjet printer, comprising:  
2           converting a first set of color pixel data having a direction-independent data format  
3           into a second set of color pixel data having a direction-dependent data format, the  
4           direction-dependent data format including at least one direction-independent data segment  
5           and at least one pair of direction-dependent data segments; and  
6           selecting the at least one direction-independent data segment and one of each of  
7           the at least one pair of direction-dependent data segments for printing the second set of  
8           color pixel data in a corresponding print direction.

1           2. The method of claim 1, wherein the selecting further includes:  
2           selecting the at least one direction-independent data segment and one of each of  
3           the at least one pair of direction-dependent data segments for printing the second set of  
4           color pixel data in a forward direction; and  
5           selecting the at least one direction-independent data segment and the other one of  
6           each of the at least one pair of direction-dependent data segments for printing the second  
7           set of color pixel data in a rearward direction.

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1           3. The method of claim 1, wherein the converting and selecting operate such that a  
2   data region in the first set representative of a particular color has the same perceived color  
3   when printed in a forward print direction and a rearward print direction.

1           4. The method of claim 1, comprising:  
2           receiving a plurality of first sets of color pixel data;  
3           determining for each first set of color pixel data the corresponding print direction  
4   for the corresponding second set of color pixel data; and  
5           printing the selected data segments for each second set of color pixel data.

1           5. The method of claim 4, wherein the printing of all data segments of an individual  
2   second set of color pixel data is performed in a single scan.

1           6. The method of claim 1, wherein the first set of color pixel data is in RGB  
2   format.

1           7. The method of claim 6, wherein the second set of color pixel data is in  
2   KYCMC'M' format.

1           8. The method of claim 6, wherein the second set of color pixel data is in  
2   KYcmCMC'M' format.

1           9. The method of claim 7, wherein the at least one direction-independent data  
2   segment is a K data segment and a Y data segment, and wherein the at least one pair of

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3 direction-dependent data segments are a C and C' pair of data segments and an M and M'  
4 pair of data segments.

1 10. The method of claim 7, wherein the at least one direction-independent data  
2 segment is a C data segment and an M data segment, and wherein the at least one pair of  
3 direction-dependent data segments are a K and K' pair of data segments and a Y and Y'  
4 pair of data segments.

1 11. The method of claim 1, wherein the first set of color pixel data is continuous-  
2 toned data and the second set of color pixel data is halftoned data wherein each individual  
3 data element represents a discrete color printable by the inkjet printer.

1 12. The method of claim 11, wherein the converting further comprises:  
2 color-converting the first set of color pixel data into an intermediate set of  
3 continuous-toned direction-dependent color pixel data; and  
4 halftoning the intermediate set to form the second set of color pixel data in which  
5 each individual data element represents a discrete color printable by the inkjet printer

1 13. The method of claim 1, wherein each direction-independent data segment and  
2 each pair of direction-dependent data segments is associated with a different color ink.

1 14. The method of claim 1, wherein each individual one of the pair of direction-  
2 dependent data segments is associated with a same color ink.

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1           15. A color map for converting an input pixel having a print-direction-independent  
2 color into an output pixel having a print-direction-dependent color, comprising:

3           a plurality of table entries, each entry having a discrete input color value and a  
4 corresponding discrete output color value;

5           wherein each input color value further comprises a prespecified combination of  
6 primitive values for print-direction-independent input color primitives, and

7           wherein each output color value further comprises a prespecified combination of  
8 primitive values for at least one print-direction-independent output color primitive and at  
9 least one pair of print-direction-dependent output color primitives.

1           16. The color map of claim 15, wherein:

2           each print-direction-independent output color primitive is associated with a  
3 different one of a set of first colors,

4           each pair of print-direction-dependent output color primitives is associated with a  
5 different one of a set of second colors, and

6           both individual ones of each pair of print-direction-dependent output color  
7 primitives are associated with a same one of the set of second colors.

1           17. The color map of claim 15, wherein:

2           the print-direction-independent input color primitives are red, green, and blue;

3           the at least one print-direction-independent output color primitive are black and  
4 yellow; and

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5 the at least one pair of print-direction-dependent output color primitives are  
6 forward-print-direction cyan and rearward-print-direction cyan, and forward-print-  
7 direction magenta and rearward-print-direction magenta.

1 18. The color map of claim 15, wherein:  
2 the print-direction-independent input color primitives are red, green, and blue;  
3 the at least one print-direction-independent output color primitive are black,  
4 yellow, light cyan, and light magenta; and

5 the at least one pair of print-direction-dependent output color primitives are  
6 forward-print-direction dark cyan and rearward-print-direction dark cyan, and forward-  
7 print-direction dark magenta and rearward-print-direction dark magenta.

1 19. The color map of claim 15, wherein:  
2 the print-direction-independent input color primitives are red, green, and blue;  
3 the at least one print-direction-independent output color primitive are magenta and  
4 cyan; and

5 the at least one pair of print-direction-dependent output color primitives are  
6 forward-print-direction black and rearward-print-direction black, and forward-print-  
7 direction yellow and rearward-print-direction yellow.

1 20. The color map of claim 15, wherein each of the at least one pair of print-  
2 direction-dependent output color primitive values are different for at least some of the  
3 table entries.

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1           21. A color printing system, comprising:  
2           a print engine for controllably ejecting drops of colored inks during bidirectional  
3 scanning;  
4           a color converter adapted to receive color print data and generate a set of data  
5 channels relating to the colored inks, the data channels including at least one print-  
6 direction-independent data channel and at least one pair of print-direction-dependent data  
7 channels; and  
8           a print controller communicatively coupled to the color converter for receiving the  
9 data channels and to the print engine for controlling the scanning direction and the  
10 ejecting, the controller configured to print data from the at least one print-direction-  
11 independent data channel during scanning in both directions and from a different one of  
12 the at least one pair of print-direction-dependent data channels during scanning in each  
13 opposite direction.

1           22. The color printing system of claim 21, wherein the color print data is  
2 continuously-toned and the set of data channels is halftoned, and wherein the color  
3 converter further comprises:  
4           a color mapper adapted to receive the color print data and generate a  
5 continuously-toned set of intermediate data channels according to a color map; and  
6           a halftoner communicatively coupled to the color mapper for converting the  
7 continuously-toned set of intermediate data channels to the halftoned set of data channels

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1           23. A color printing system, comprising:

2           a print engine for controllably ejecting drops of colored inks during bidirectional  
3 scanning;

4           a color converter adapted to receive color print data and generate a set of data  
5 channels relating to the ink colors of the system, the data channels including a single data  
6 channel for some ink colors and a pair of data channels for other ink colors; and

7           a print controller communicatively coupled to the color converter for receiving the  
8 data channels and to the print engine for controlling the scanning direction and the  
9 ejecting, the controller configured to determine which of the pair of data channels to use  
10 during printing in a particular scanning direction so as to cause a particular color of print  
11 data to have the same perceived color when printed in either scanning direction.

1           24. The color printing system of claim 23, wherein the color converter generates  
2 the set of data channels without knowledge of the particular scanning direction.